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(54) Method of attaching fitments in a vertical form fill and seal machine

(57) A vertical form fill and seal (VFFS) machine is configured to place a fitment, such as a spout (102), on the longitudinal fin seal (104) of a container (200, Fig. 4). The fitment (102) dispatched from a vibratory bowl (22) via an adjustable track (24). The fitment is then secured to edges of the film (100) by longitudinal sealing bars (26) and the edges of the film are likewise secured to each other by the longitudinal sealing bars (26) thereby forming a longitudinal fin seal (104). Depressions are machined in the machine direction center of the sealing bars (26) in order to accommodate the shape of the fitment (102). The film is drawn over an oversized collar (18) and an undersized tube (12) and bars (40, 42, Fig. 3) so as to create excess film in order to form gussets providing a stand-alone capability.

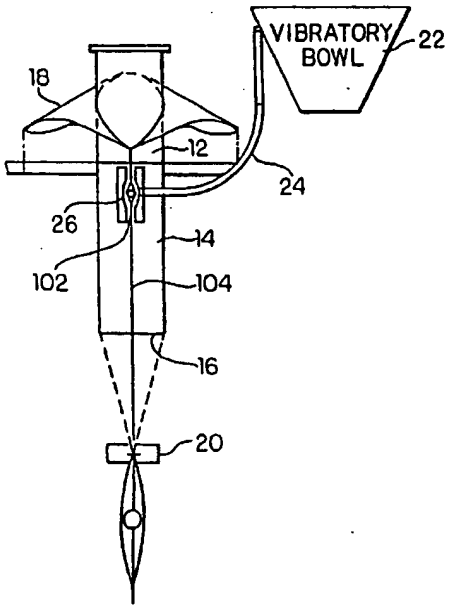

FIG. 1

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Description

[0001] This invention pertains to a method for attaching a fitment to a package being assembled in a vertical form fill and seal machine by feeding the fitments, such as a spout for a pouch, from a vibratory bowl and using longitudinal sealing bars to secure the fitment to the edges of the film and further to secure the edges of the film to each other to form a longitudinal fin seal.

[0002] Vertical form fill and seal (VFFS) machines are known in the prior art for forming a container, filling the container with foodstuffs or similar items, and sealing the container. These machines are advantageous in that all three steps are performed in rapid succession in substantially the same location.

[0003] However, heretofore, while the advantages of bag-type or pouch containers with a fitment or spout, particularly when the containers are filled with a liquid or paste, have been recognized in references such as US-A-5,606,844, the vertical form fill and seal machines have not been adapted to place a fitment, such as a spout, on the longitudinal fin seal of the container being formed, filled and sealed. Similarly, while the use of a horizontal flow, vertical fill machine to put fitments on the bottom folded edge of the resulting pouch has been disclosed in US-A-4,512,136, this has not resulted in a pouch with the fitment fitted along the longitudinal fin seal of the pouch, particularly a free-standing pouch manufactured by a vertical form fill and seal apparatus.

[0004] Other prior art appears to contemplate sealing fitments to a package on a form fill and seal machine. However, this art appears to be directed to a sealing of a flanged fitment to either the inside wall of the film or the outside wall of the film and puncturing the film to activate the fitment. This art does not disclose the use of a vertical form fill and seal machine to secure to the fitment to the longitudinal fin seal of the pouch.

[0005] Prior art in this general field further includes US-A-5,862,652 and US-A-3,376,687.

[0006] According to this invention a vertical form fill and seal machine has cross-sealing jaws and longitudinal sealing jaws. The longitudinal sealing bars have shaped sealing surfaces at the fin area, with depressions machined in the machine direction center of the longitudinal sealing bars to accommodate the shape of a fitment. Fitments typically have "boat" shaped bosses to facilitate the transition from film to fitment sealing to film to film sealing. The fitments are dispensed from a vibratory bowl assembly onto a track, and down to the center of the sealing bars to match the machined depressions. The sealing bars seal the edges or fins of film around the fitment, and to each other above and below the fitment thereby forming the longitudinal fin seal. The vertical position of the longitudinal sealing bars and the fitment delivery track is adjustable during a size change-over time.

[0007] Optionally, the machine can include a device which forms a double fold for a free-standing or stand-up characteristic. This optional device uses the double gusset folding mechanism to fold the excess film created by the oversized collar and undersized tube.

[0008] This film is punched in registration to create an ability to seal the outer layers of the film gussets together at the gusset sealers and/or cross-sealing jaws. Alternatively, the film may be formed with a sealant layer on both sides to facilitate sealing the outside layers to each other. Additionally, if a free-standing or stand-up characteristic is desired, the gussets are sealed below the guiding ribs or transition point.

[0009] A set of pinching spreaders are positioned below the cross-sealing jaws to pinch or spread the gussets immediately prior to filling, and to create additional space for the product and to move the product away from the cross-sealing jaws thereby improving the cross-seal conditions.

[0010] Optionally, the longitudinal sealing bars may include more than one set of depressions resulting in multiple film to fitment sealing positions.

[0011] A particular example in this invention will now be described with reference to the accompanying drawings; in which:-

Figure 1 is a front elevation of the vertical form fill and seal machine of the present invention;
Figure 2 is a side elevation of the vertical form fill and seal machine of the present invention;
Figure 3 is a cross-sectional view of the tube and collar of the vertical form fill and seal machine of the present invention, illustrating how the stand-up feature of the pouch is implemented on the film;
Figure 4 is a perspective view of a typical resulting package with a fitment; and,
Figure 5 is a perspective view of a typical fitment used with the present invention.

[0012] Referring now to the drawings an oversized cylindrical collar 12 is formed concentrically about undersized tube 14. As is known with form fill and seal machines, the contents of the resulting pouch is fed through bottom opening 16 of tube 14 into the pouch which is formed by the film 100 which passes over collar 12 and tube 14 as guided by obliquely oriented shoulder 18 (also see Figures 2 and 3). Cross-sealing jaws 20 are formed horizontally below bottom opening 16 of tube 14 in order to cut the film 100 into separate bags or pouches and to form the transverse seal and hence the package which secures the contents during the initial filling. Cross-sealing jaws 20 furthermore seal the previously filled package during the same step.

[0013] Vibratory bowl 22 is situated so tube 14 dispatches fitments 102 via telescoping track 24 to longitudinal sealing bars 26 which secure the edges of the film 100 to fitment 102 (see Figures 4 and 5 for the detail of a typical fitment 102, which typically includes "boat" shaped bosses 110, a threaded spout 112, and a threaded cap 114). The longitudinal sealing bars 26 further join

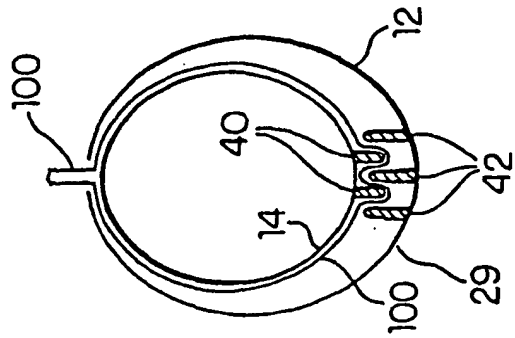

FIG. 3

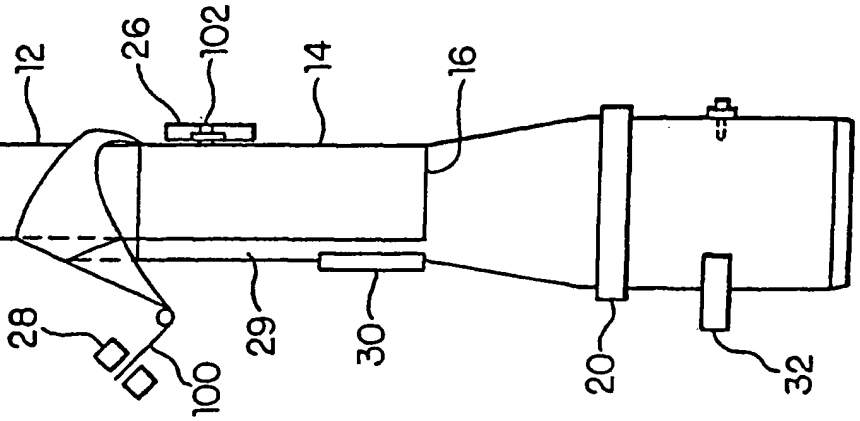

FIG. 2

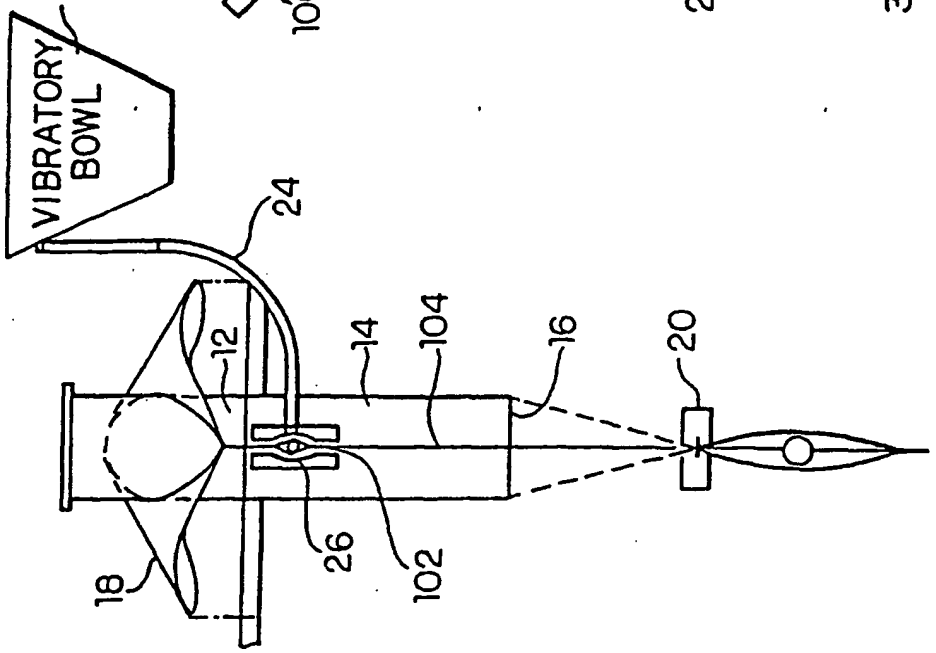

FIG. 1

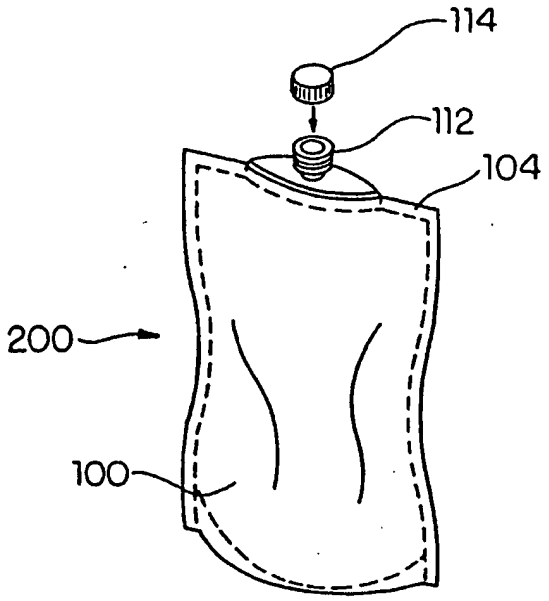

FIG. 4

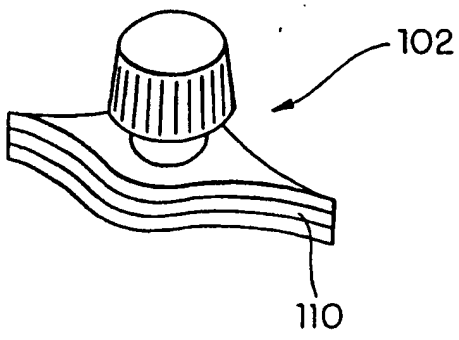

FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 00 31 0481

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B65B
B31B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	5 March 2001	Grentzius, W

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 31 0481

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82